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(54) Title: DOSING OF PEROXIDE TO A SUSPENSION PROCESS WHEREIN STYRENE IS POLYMERIZED

(57) Abstract: The invention relates to a suspension polymerization process for the preparation of styrene-containing (co)polymers, wherein the process comprises the steps of continuously or semi-continuously dosing an initiator to the reaction mixture, said initiator having a specified half-life at the temperature of the reaction mixture to which it is dosed. The invention further relates to styrene based (co)polymer obtainable by said process, and to the use of said styrene (co)polymer in a shaping process.

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INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08F12/08 C08F257/02 C08F2/18

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08F F21V C08J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 189 069 A (BRETSCHNEIDER JUERGEN ET AL) 23 February 1993 (1993-02-23) * abstract ; claim 1 ; column 2, line 20-32 ; column 3, line 33-37, 48-66 *	1-11
X	US 3 451 985 A (MAHLO EDWIN K) 24 June 1969 (1969-06-24) * column 2, line 9-22 ; column 4, line 54-59 "styrene" ; column 1, line 11-46 ; claims 1-3 *	1-10
X	US 4 363 881 A (SMITH STUART B) 14 December 1982 (1982-12-14) * claims 9-15 ; column 3, line 16-21, 29-32, 41-59 ; column 4, line 25-28 *	1-5,7-11
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"Z" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 086 591 A (MONSANTO CO) 11 October 1967 (1967-10-11) * claims 1-4 ; example 5 ; page 2, line 83-90 ; page 2, line 17-64 *	1-7,9
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X	WO 00/17245 A (AKZO NOBEL NV ; SCHUT JACOBUS (NL); WESTMIJZE HANS (NL); SWIETEN ANDRE) 30 March 2000 (2000-03-30) * abstract ; page 2, line 11-16 ; page 3, line 12 - page 6, line 13 ; page 2, line 24 "styrene".	1-10
X	EP 0 390 000 A (IDEMITSU PETROCHEMICAL CO) 3 October 1990 (1990-10-03) * column 2, line 30 - column 3, line 33 ; column 7, line 15, 21-26 ; abstract ; column 5, line 47 - column 6, line 54 ; claims 1,4,5 *	1-7,9,10
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A	DE 199 11 960 A (BASF AG) 21 September 2000 (2000-09-21) * claims 1-8 *	1-11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2004/003661

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1 - 11

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11

An "essentially vinyl chloride-free" suspension polymerisation process for polymerising styrene monomer, or a mixture of monomers comprising styrene, comprising the step of continuously or semi-continuously dosing an initiator, or a mixture of initiators, to the reaction mixture at the polymerisation temperature, characterised in that at least one initiator that is dosed has a half-life of 60 minutes or less at said polymerisation temperature.

2. claim: 12

Styrene based (co) polymer "obtainable" by a process as described in the application claim 12.

3. claim: 13

The use in a shaping process for the preparation of foamed articles of a styrene (co) polymer as described in application claim 13.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2004/003661

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